Catalogue no. 11-626-X — No. 008
ISSN 1927-503X
ISBN 978-1-100-20776-6

Analytical Paper

Economic Insights

Wage Growth over the Past 30 Years: Changing Wages by Age and Education

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Published by authority of the Minister responsible for Statistics Canada

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.	not available for any reference period
..	not available for a specific reference period
...	not applicable
0	true zero or a value rounded to zero
0^s	value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
^{p}	preliminary
^{r}	revised
x	suppressed to meet the confidentiality requirements of the *Statistics Act*
^{E}	use with caution
F	too unreliable to be published
*	significantly different from reference category ($p < 0.05$)

Wage Growth over the Past 30 Years: Changing Wages by Age and Education

by René Morissette, Garnett Picot, and Yuqian Lu

This article in the *Economic Insights* series examines two questions: (1) Which groups of Canadian workers have experienced stronger real wage growth over the past three decades?; and (2) To what extent do individuals' acquisition of education, general work experience, and seniority within firms, as well as their movements into higher-wage or lower-wage occupations and industries, account for differences in real wage growth observed across groups of workers? This article uses data from various Statistics Canada surveys and focuses on the real (hourly or weekly) wages earned by full-time workers. It is based on research carried out at Statistics Canada aimed at providing information on how wage rates of Canadian workers have changed over the past three decades. Wages are expressed in 2010 dollars.

Since the early 1980s, real wages of various groups of workers have grown at markedly different rates in Canada and in many industrialized Western countries. Technological changes, growth in international trade, institutional factors (e.g., de-unionization, changes in minimum wages, and changes in the incidence of pay-for-performance), movements in group-specific labour supplies, and changes in social norms have been cited as potential drivers of this differential wage growth. To help shed some light on this matter, the article examines how real wages of Canadian workers evolved across age groups and education levels from 1981 to 2011.

Markedly different wage growth across age groups

Over the past three decades, Canada has experienced periods of markedly different wage growth. Average real wage rates of Canadian workers grew little during the 1980s and the 1990s before rising at a faster pace during the 2000s (Chart 1). From 1981 to 1998, average real **hourly** wages of full-time workers aged 17 to 64 increased by a total of roughly 4%, less than half the growth rate of 10% observed during the shorter 1998-to-2011 period. Overall, average hourly wages of full-time workers increased by 14% from 1981 to 2011.

Within the overall trends, workers of different ages experienced markedly different wage growth. Pay rates of workers in their mid-forties to mid-fifties rose faster than those of younger workers (aged 25 to 34). From 1981 to 2011, average hourly wages increased by 17% among men aged 45 to 54, but increased by only 1% among men aged 25 to 34. Hourly wages of women aged 45 to 54 grew by 33%, more than twice the 14% rate observed for younger women.

These differences across age groups emerged because workers aged 45 to 54 experienced much faster wage growth than did younger workers during the period from 1981 to 1998. From 1981 to 1998, average hourly wages of men aged 45 to 54 grew

Chart 1
Real hourly wages of full-time workers aged 17 to 64, 1981 to 2011

Note: Estimates for 1982, 1983, 1985, and 1991-to-1996 are based on interpolations of data.
Source: Statistics Canada, authors' calculations.

by 14% while those of young men fell by 8% (Chart 2). Average wages of women aged 45 to 54 increased by 20% while those of younger women were relatively flat.

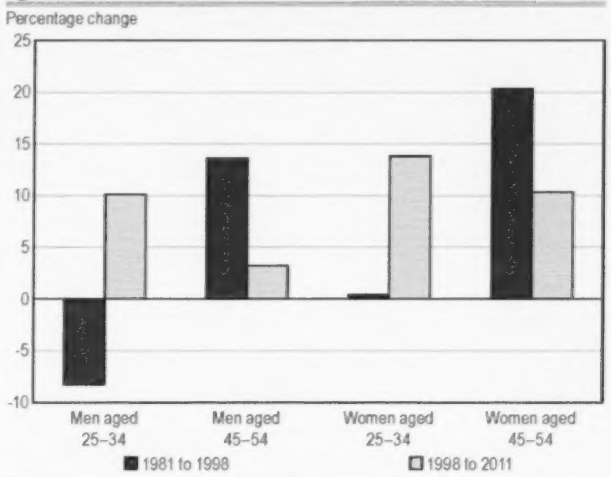
Several factors may explain why young workers experienced slower wage growth than workers aged 45 to 54 between 1981 and 1998. During that period, the unionization rates of younger men and women fell substantially—by at least 12 percentage points—while those of men and women aged 45 to 54 either dropped slightly or increased.[1] Younger workers' average seniority levels fell whereas older workers (especially older women) experienced an increase in seniority. Younger workers moved away from high-wage sectors such as public services while older workers increased their presence in this sector. Finally, the participation of younger workers in high-wage occupations (such as those in natural and social sciences) grew at a slower pace than that of older workers. Together, these factors account for about 40% of the difference in wage growth observed between young men and men aged 45 to 54 from 1981 to 1998. These factors played a more important role for women, accounting for roughly three-quarters of the difference in wage growth observed between young women and their older counterparts.

The period from 1998 to 2011 marked a recovery in the wages of younger workers. From 1998 to 2011, average hourly wages of young men increased by 10% while those of men aged 45 to 54 grew by 3%. The corresponding numbers for women were 14% and 10%, respectively.

The faster wage growth experienced by young men after the late 1990s occurred to a large extent because the relative changes in unionization, industry, and occupation—which favoured men aged 45 to 54 between 1981 and 1998—became more advantageous to younger men subsequently. From 1998 to 2011, young men fared better than men aged 45 to 54 in terms of unionization and the types of occupations and industries in which they worked. While the unionization rate of young men changed little, the unionization rate of men aged 45 to 54 fell by 10 percentage points. Young men moved into high-wage industries such as construction, mining, and oil and gas extraction to a greater extent than men aged 45 to 54. They maintained a stable share of employment in the high-paying health, education, and welfare sectors as well as in public administration. In contrast, men aged 45 to 54 saw their employment share in these sectors drop by almost 6 percentage points. These differential changes in unionization, industry, and occupation explain roughly 60% of the difference in wage growth observed between young men and men aged 45 to 54 between 1998 and 2011.

As was the case for young men, differential movements in unionization, industry, and occupation favoured young women after the late 1990s. In addition, young women increased their educational attainment faster than did women aged 45 to 54. Together, these four factors account entirely for the faster wage growth experienced by young women, compared to that experienced by women aged 45 to 54, since the late 1990s.

Chart 2
Percentage change in average real hourly wages by sex and age, 1981 to 1998 and 1998 to 2011



Source: Statistics Canada, authors' calculations.

Narrowing of wage differences across education levels during the 2000s

As Canadian firms adjusted to a fast-changing global economic environment, pay rates grew at a different pace not only across age groups but also across education levels. According to Census data, average real **weekly** wages of full-time male workers aged 17 to 64 with high school diplomas or trades certificates remained virtually unchanged from 1980 to 2000. In contrast, average weekly wages of men with bachelor degrees rose by 16%. As a result, wage differences between highly-educated men and their less educated counterparts widened substantially from 1980 to 2000. Among individuals with comparable work experience, pay differences across education levels increased, especially for men (Boudarbat et al. 2010).

This pattern was reversed in the 2000s. Data from the Labour Force Survey indicate that average real weekly wages of full-time male workers with trades certificates grew by 8% from 2000 to 2011. In contrast, those of males with bachelor degrees increased by only 2%. As a result, the wage gap between males with bachelor degrees and males with trades certificates narrowed during the 2000s. The wage gap between male bachelor degree holders and male high school graduates also narrowed, but to a lesser extent.

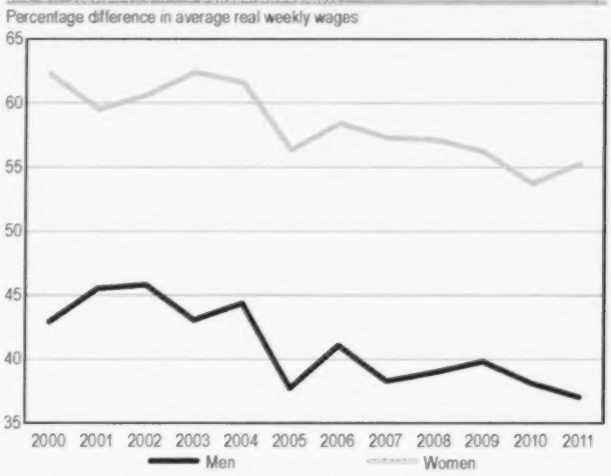
The narrowing of the wage gap was particularly evident among the young, as wage growth was relatively stronger among less educated younger workers. For example, between 2000 and

1 About one-third of the decline in the unionization rates of younger men and women can be accounted for by changes in the types of occupations and industries in which they were employed.

2011, average weekly wages grew by 14% among full-time male workers aged 25 to 34 with trades certificates and by about 7% among their counterparts with high school diplomas. Among bachelor degree holders, growth was 1%.

This recent narrowing of wage differences among men across education levels is also observed in multivariate analyses that take account of differences in workers' potential work experience[2] and in analyses that use hourly wages, instead of weekly wages, as a measure of pay rates. A narrowing of pay differences is also found in such analyses among women. Nevertheless, highly-educated workers today still earn much more than their less educated counterparts. Controlling for potential work experience, average weekly wages of male bachelor degree holders were 37% higher than those of male high school graduates in 2011, down from 43% in 2000 (Chart 3).[3] The corresponding result for women in 2011 was 55%, down from 62% in 2000.

Chart 3
Wage gap between bachelor degree holders and high school graduates, 2000 to 2011 (controlling for potential work experience)



Source: Statistics Canada, authors' calculations based on Labour Force Survey

Summary

On average, wages of Canadian full-time workers grew faster during the 2000s than during the previous two decades. Yet wage growth was far from uniform. From 1981 to 1998, men and women aged 45 to 54 experienced faster wage growth than did their younger counterparts aged 25 to 34. The opposite was true from 1998 to 2011.

From 1980 to 2000, wages of males with bachelor degrees grew faster than those of males with trades certificates or high school diplomas while the opposite trend prevailed in the 2000s. Among workers with comparable work experience, pay differences across education levels widened during the first two decades but narrowed during the 2000s.

The compression of wage differences in Canada across education levels since 2000 has coincided with three important economic shocks: a severe employment contraction in the computer and telecommunications industries between 2001 and 2004, a strong construction sector, and an increase in the world prices of oil and other commodities produced in Canada. While the first shock may have reduced upward pressures on labour demand for university graduates, the last two likely supported employment growth in the construction, mining, and oil and gas extraction industries, thereby potentially increasing the demand for other workers despite the decline in manufacturing employment since the mid-2000s. Additional research would be needed in order to confirm these hypotheses.

2 In line with Boudarbat *et al.* (2010), potential work experience is defined as a person's age minus the number of years of completed schooling, minus six.
3 These numbers result from multivariate analyses performed in this study on full-time male workers aged 17 to 64.

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This article in the *Economic Insights* series is based on Social Analysis Division research into changes in the Canadian wage structure. For more information on previous trends, see:

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